PREFACE BY TRANSLATOR INTO ENGLISH

MOKE or less mystery has enveloped the designing and construction of metallurgical furnaces. Blue-prints with the titles removed and tables of supposedly important features have been carefully treasured. When new furnaces were to be designed an extensive analysis was frequently made of what was known of the work of others, and an endeavor was made to "improve" upon them. During construction other plants were visited and further improvements were frequently made, with the result that the finished furnace departed widely from the drawings. Not infrequently the starting up of a new furnace was signalized by an acrid meeting of the lodge of sorrow and by expensive reconstruction and loss of product. During the campaign of the furnace the question, "What can be done to change it?" was a live issue. Certain parts of the furnace had to be rebuilt from time to time, and this afforded a certain amount of opportunity to correct early errors, provided they had been rightly diagnosed.

Some years ago, the writer became convinced that the flow of gases in a furnace was entirely devoid of mystery, being governed by the laws of elementary physics. Several furnace designers were asked, as the occasion offered, whether they based their design upon experience and upon the proportions of working furnaces or used formulas for the flow of the gases. The replies received were interestingly noncommittal. The physical laws of flowing fluids, however, were found to agree very closely with practical observations. They explained, with remarkable clarity, some mysterious troubles.

Later, the writer got in touch with the work of Professors Grourne-Grjimailo and Yesmann. Professor Groume-Grjimailo had gone over the ground very thoroughly several

years before the writer became interested in furnace work, and had conducted numerous experiments with model furnaces. He had simulated the flow of the gases and the effects of the atmosphere by immers-